GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

MEMORANDUM

DATE:

November 14, 2011

TO:

Chris Lanane, Scott Weaver

FROM:

Mike Horn

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Stanley Site, November 14, 2011," for your review. Please refer any comments you may have on the document to me by January 16, 2012. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

SITE: STANLEY SITE

Report Date: November 14, 2011 Prepared by: Mike S. Horn

1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Stanley was audited on November 14, 2011. The audit was conducted by Mike Horn and was witnessed by Scott Weaver, who is the site operator.

2.0 Parameters Audited:

T.E.O.M. PM-10

3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) AUDIT

Date of report:	11/14/11					
Date:	11/14/11			Site name: S	Stanley Site	
Start:	10:40hrs. PS	ST		Operator: S	Scott Weaver	
Finish:	11:00hrs. PS	T		Project: 9	SB 270	
Audited By:	Mike Horn			Site Elevation:	N/A	ft.
Witness:	Scott Weaver			Amb. Pres.:	890.70	hPa
				Amb. Temp.:	20.8	deg. C
Prop. or Serial No.:	793/23573			Make:	R & P	
Туре:	PM-10			Model:	1400ab	
				Last cal. date:	10/6/11	
	AUD	TT DEVICE(S)				
Make:	BGI Incorporated			Make: I	3GI Incorporated	
Model:	DELTA CAL			Model: I	DELTA CAL	
S/N:	525			S/N:	123	
Range:	2 - 20 lpi	m		Range:	2 - 20	lpm
	Calibration Factors			Slope: 0	Calibration Factor	S
Slope:	1.00			Intercept:	1.00	
Intercept:	0.00			Cal Date:	0.00	
Cal Date:	12/22/10 Da	ate of first use	1/12/11		12/22/10	
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.
Leak check:	0.110	0.270	21.1	0.3	886.38	-4.3
Pump off leak check:	N/A	N/A				
	$Qa = [dPxTa/Pa]^{1/2} + b$	•	Site		Nominal	Flow Rates
Audit	Audit Flow	Rate,	Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	16.47	16.47	16.65	1.1	15.0	18.4
Bypass/Aux Flow Rate	13.42	13.42	13.66	1.8		
Main Flow Rate	2.97	2.97	2.99	0.7	2.7	3.3
Total Flow Rate	16.43	16.43	16.65	1.3	15.0	18.4

Comments: None.

TABLE A-1

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measuremen	<u>nt Variable</u>	Evaluation Criteria
Wind Speed		At ws \leq 5 m/s, input \pm 0.25 m/s; At ws $>$ 5 m/s, input \pm 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direct	ion	input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatur	e	input $\pm0.5^\circ$ C Gravimetry Lab ±1.0 deg. C input $\pm2.0^\circ$ C for PM-10, PM-2.5 samplers
Relative Hui	midity	Ambient: input \pm 5% RH, \pm 1.5°C as dew point Gravimetry Lab: input \pm 5%
Precipitation	l	input ± 10%
Barometric I	Pressure	Ambient: input \pm 10 hPa TEOM: \pm 10 mm mercury
PM-10: Hi-V PM-2.5	ol SSI, Partisol, BGI,	input \pm 10%; Design Flow \pm 10% input \pm 4%; Design Flow \pm 5%
TEOM:	Total Flow Main Flow Bypass Flow	input \pm 10%; Design Flow \pm 10% input \pm 10%; Design Flow \pm 10% input \pm 10%; Design Flow \pm 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM Bypass Flow: < 0.60 LPM

Appendix B

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

AUDIT DEVICE

THE BAR BUTTER	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	Р9	12/17/10	1.0	0.0
RM Young wind speed motor:	CU10, HS10	8/30/11	N/A	N/A
Psychro-Dyne Psychrometer:	RH 04	N/A	1 0	
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

				ir Pollution Co				
	т	apered l		lating Microba	lance (TEOM)	5 11 17 1 1 to 10 1		
		т	FLO	W AUDIT		.vevevu.esus.vu	even sermed felf	1900
	+							
B-4			ļ	6	01			
Date				Site Name				
Start		PST		Operator		Weave		
Finish:	13:25	PST			SB270			
	1004 1000 1000		1	Site Elevation		ft		1
				Amb. Press.	20.8	in. Hg		1
				Amb. Temp.:	8967	deg. C		1
	0 1				10,00			
Prop. Or Ser. No.:	773/	235	73	Make:	R&P			
Type:	PM10	1000		Model	1400a /			177
			1	Last Cal. Date:	18/0/11			
				T	10/0/11			1
		Audit I	Device(s)					
Make:	BGI INCOR			Make:	BGI INCOR	DODATED	r	
Model:		LUKALI	J D	Model:	MAT THAT	UNATED		
S/N:	Andread on the Control of the Contro	10		S/N:	WELLIA WAL	· · · · · · · · · · · · · · · · · · ·		-
Range:	2 20	Inm			0123	Inm		-
Calibration factors:	2 - 20	ibiii	Calib	Range: ration factors:	2 - 20	ıpm		-
		ļ	Calib				24.40	-
Slope:	1.0			Slope:				-
Int.:	0.40 /			Int.:	0.0			
Cal Date:	114/16			Cal Date:				
				1				
Q _a =m[c	dPxT _e /P _e J ^{1/2} +b		Altitude Corre	ection Factor:	÷ 1013			
					1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			ļ
Leak Check-Initial	Main:	1)	Aux:	.27				
Leak Check-Final	Main:	- //	Aux:	VV				
10070					//			
			Site		Nominal FI	ow Rates		-
Audit	Audit Flow	Rate	Flow Rate	Diff.	Lower Limit			
Point		(VLPM)	(VLPM)	(%)	(LPM)	(LPM)		-
Total Fow Rate	11 47		199/12	11-11	45.0	18.4		
Aux. Flow Rate	12 112		44/10	06-16	2620.0	10.4		
Main Flow Rate	17.04		13.88		2.7			
Total Flow Rate	17:115		dille		15.0	3.3		
TOWITTOW Nate	16.43		16.65		15.0	18.4		
					35.00			
	Commit		Stan					
Amab T	Sampler		True	Raw				
Amb Temp	2/3/			20.8				
Amb Press	815		886.38	870.7			2911	
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	-117-							
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Comments:		1						
Calibrated By:	01-11	1						

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

MEMORANDUM

DATE:

July 20, 2011

TO:

Chris Lanane, Scott Weaver

FROM:

Mike Horn ///

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Stanley Site, July 20, 2011," for your review. Please refer any comments you may have on the document to me by September 20, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

SITE: STANLEY SITE

Report Date: July 20, 2011 Prepared by: Mike S. Horn

1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Stanley was audited on July 20, 2011. The audit was conducted by Mike Horn and was witnessed by Scott Weaver, who is the site operator.

2.0 Parameters Audited:

T.E.O.M. PM-10

3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) AUDIT

Date of report:	7/20/11					
Date:	7/20/11			Site name: S	Stanley Site	
Start:	10:40hrs. PS	ΣT		Operator: S	Scott Weaver	
Finish:	11:00hrs. PS	δΤ		Project: S	SB 270	
Audited By:	Mike Horn			Site Elevation:	N/A f	t.
Witness:	Scott Weaver			Amb. Pres.:	891.20 h	nPa
				Amb. Temp.:	31.3 d	leg. C
Prop. or Serial No.:	N/A			Make:	R & P	
Type:	PM-10			Model:	1400ab	
,,,				Last cal. date:	6/7/11	
	AUD!	IT DEVICE(S)				
Make:	BGI Incorporated			Make: I	3GI Incorporated	
	DELTA CAL			Model: I	DELTA CAL	
S/N:	525			S/N:	123	
Range:	2 - 20 lp:	m		Range:	2 - 20 1	pm
	Calibration Factors			Slope: (Calibration Factors	•
Slope:	1.00			Intercept:	1.00	
Intercept:	0.00			Cal Date:	0.00	
Cal Date:	12/22/10 Da	ate of first use 1	1/12/11		12/22/10	
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.
Leak check:	0.100	0.160	30.1	-1.2	888.40	-2.8
Pump off leak check:	N/A	N/A				
	$Qa = [dPxTa/Pa]^{1/2} + b$)	Site		Nominal l	Flow Rates
Audit	Audit Flow	v Rate,	Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	16.99	16.99	16.66	-1.9	15.0	18.4
Bypass/Aux Flow Rate	13.89	13.89	13.66	-1.7		
Main Flow Rate	3.09	3.09	3.00	-2.9	2.7	3.3
Total Flow Rate	17.04	17.04	16.66	-2.2	15.0	18.4

Comments: None.

TABLE A-1

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measuremen	nt Variable	Evaluation Criteria
Wind Speed		At ws \leq 5 m/s, input \pm 0.25 m/s; At ws $>$ 5 m/s, input \pm 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direct	ion	input \pm 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatur	e	input \pm 0.5° C input \pm 2.0° C for PM-10, PM-2.5 samplers
Relative Hu	midity	Ambient: input \pm 5% RH, \pm 1.5°C as dew point Gravimetry Lab: input \pm 5%
Precipitation	ı	input $\pm 10\%$
Barometric 2	Pressure	Ambient: input ± 10 hPa TEOM: ± 10 mm mercury
PM-10: Hi-V PM-2.5	Vol SSI, Partisol, BGI,	input \pm 10%; Design Flow \pm 10% input \pm 4%; Design Flow \pm 5%
TEOM:	Total Flow Main Flow Bypass Flow	input \pm 10%; Design Flow \pm 10% input \pm 10%; Design Flow \pm 10% input \pm 10%; Design Flow \pm 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM

Bypass Flow: < 0.60 LPM

Appendix B

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

AUDIT DEVICE

	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

		Great B	asin Unified A	ir Pollution Co	ontrol District			===
		apered	Element Oscil	llating Microba	lance (TEOM)	*****		
			FLO	TIDUA WO			*****	14
Deta	- h.t.	-			04	/		
Date: Start:	1000	007		Site Name		1		
Finish:		PST		Operator	scott?	Leave		
- ransn.	11.00	PST	- 		: SB270 0			
	 			Site Elevation		ft in. Hg		
				Amb. Press.				
			 	Amb. Temp.	31.3	deg. C		
Prop. Or Ser. No.:	793/	2357	73	Make	DOD			
	PM10	1201			1400a/ /		-	
				Last Cal. Date:				
	·	-	·	Date:	6/1/11			
		Audit	Device(s)	 				
Make:	BGI INCOR	DODAT	TD.	Make:	PCT THEOR	DODATES	-	
Model:	DELTA CAL	JE UKAI.	90	Model:	THE LINE WILLIAM	GROKATED		
S/N:	0123 5	125		S/N:	WILL THE WAL	T	ļ	
Range:	2 - 20	Ipm	1	Range:		Inm		
Calibration factors:		1	Calibi	ration factors:	2 - 20	·pin		
Slope:	1.0			Slope:	1.0			
Int.:	0.0			Int.:	0.0			
Cal Date:	1/4/11			Cal Date:	0.0		i	
	- May 3/ 00					·		7.00
Q _a =m[d	PxT _e /P _e J ^{1/2} +b		Altitude Corre	ection Factor:	÷1013			
					. 1012			
Leak Check-Initial	Main:	.10	Aux:	.16				. % **)
Leak Check-Final	Main:	110	Aux:	1 /- 12				
			Site		Nominal F	ow Rates		
Audit	Audit Flow	Rate	Flow Rate	Diff.	Lower Limit			
Point	delta P	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)		
Total Fow Rate	16.79		3.00/13	66= 16.68	15.0	18.4	1	
Aux. Flow Rate	13 89		73.16	100				
Main Flow Rate	3.09		3.00		2.7	3.3		
Total Flow Rate	17.04		16-66		15.0	18.4		
			Stand					
	Sampler		True	Raw				
Amb Temp	30.1			31.3				
Amb Press	. 8//		888.40	891.2				
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GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

MEMORANDUM

DATE:

April 21, 2011

TO:

Chris Lanane, Scott Weaver

FROM:

Mike Horn //

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Stanley Site, April 21, 2011," for your review. Please refer any comments you may have on the document to me by June 21, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

SITE: STANLEY SITE

Report Date: April 21, 2011 Prepared by: Mike S. Horn

1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

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2.0 Parameters Audited:

T.E.O.M. PM-10

3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) AUDIT

Date of report:	4/21/11					
Date:	4/20/11			Site name: S	tanley Site	
Start:	10:30hrs. PS	ST		Operator: S	cott Weaver	
Finish:	10:45hrs. PS	ST		Project: S	B 270	
Audited By:	Mike Horn			Site Elevation:	N/A ft.	
Witness:	Scott Weaver			Amb. Pres.:	887.20 hF	^o a
				Amb. Temp.:	20.7 de	g. C
Prop. or Serial No.:	N/A			Make:	R & P	
Туре:	PM-10			Model:	1400ab	
				Last cal. date:	3/14/11	
	AUD	IT DEVICE(S)				
Make: 1	BGI Incorporated			Make: F	BGI Incorporated	
Model: 1	DELTA CAL			Model: I	DELTA CAL	
S/N:	525			S/N:	123	
Range:	2 - 20 lp	m		Range:	2 - 20 lp	m
	Calibration Factors			Slope: <u>(</u>	Calibration Factors	
Slope:	1.00			Intercept:	1.00	
Intercept:	0.00			Cal Date:	0.00	
Cal Date:	12/22/10 Da	ate of first use 1	1/12/11		12/22/10	
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.
Leak check:	0.100	0.150	20.3	-0.4	884.35	-2.9
Pump off leak check:	N/A	N/A				
(Qa=[dPxTa/Pa] ^{1/2} +b)	Site		Nominal Fl	ow Rates
Audit	Audit Flov	v Rate,	Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	17.06	17.06	16.66	-2.3	15.0	18.4
Bypass/Aux Flow Rate	13.91	13.91	13.66	-1.8		
Main Flow Rate	3.09	3.09	3.00	-2.9	2.7	3.3
Total Flow Rate	17.14	17.14	16.66	-2.8	15.0	18.4

Comments: None.

Appendix B

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

AUDIT DEVICE

AUDIT DEVICE	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

TABLE A-1

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measuremen	nt Variable	Evaluation Criteria
Wind Speed		At ws \leq 5 m/s, input \pm 0.25 m/s; At ws $>$ 5 m/s, input \pm 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direct	ion	input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatur	e	input \pm 0.5° C input \pm 2.0° C for PM-10, PM-2.5 samplers
Relative Hu	midity	Ambient: input \pm 5% RH, \pm 1.5°C as dew point Gravimetry Lab: input \pm 5%
Precipitation	1	input $\pm 10\%$
Barometric 1	Pressure	Ambient: input \pm 10 hPa TEOM: \pm 10 mm mercury
PM-10: Hi-V PM-2.5	Vol SSI, Partisol, BGI,	input \pm 10%; Design Flow \pm 10% input \pm 4%; Design Flow \pm 5%
TEOM:	Total Flow Main Flow Bypass Flow	input \pm 10%; Design Flow \pm 10% input \pm 10%; Design Flow \pm 10% input \pm 10%; Design Flow \pm 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM

Bypass Flow: < 0.60 LPM

5 5.0 350 Marie				ir Pollution Co lating Microba		777 77.2000		
		apered		W AUDIT	nance (TEOM)	121119000 800	*) : •)(e:30.5 ½	
		Т	FLO	WAUDII	Т	7		-
	-			+	·			<u> </u>
Date	11/2-14			074 - 41	01-1			
Star	1.100.11.	DOT		Site Name		1		
	10.00	PST		Operator		Weave		
Finish	10:45	PST		Project	SB270 /			
				Site Elevation		ft		
×				Amb. Press.		in. Hg		1
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				Amb. Temp.	20.7	deg. C		1
	- Aurent - I				/			
Prop. Or Ser. No.		735	73	Make	R&P			
Туре	: PM10 /			Model	1400a .			
				Last Cal. Date:	3/14/11			
-114/10				T	3/1/1/			
		Audit	Device(s)		· · · · · · · · · · · · · · · · · · ·	1		-
Make	BGI INCOR			Make:	RCT THEOR	DODATED	i	_
Model	DELTA CAL	FORAL	<u> </u>	Model:	BGI INCOM	CEOKATED		
S/N:	0123 6	12/	-	S/N:	DEL TA CAL	1		
Range:	Makeline	25			0123	1		
Calibration factors:	2 - 20	lpm	C-121	Range:	2 - 20	lpm		
		ļ	Calib	ration factors:				
Slope:				Slope:	1.0			
Int.:	0.01			Int.:	0.0			
Cal Date:	1/4/11			Cal Date:				
	/ -"				/3			
Q _a =m[c	dPxT _e /P _e J ^{1/2} +b		Altitude Corre	ection Factor:	÷1013			
				I	. 1012			
Leak Check-Initial	Main:	.10	Aux:	75				
Leak Check-Final	Main:	.10	Aux:					
			Site		Maminal C	- B 4		
Audit	Audit Flow	Dete	Flow Rate	Diff.	Nominal F			
Point			the second second second second second second		Lower Limit			
	ueita P	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)		
Total Fow Rate	1206		3.06/13.6)	6-14.66	15.0	18.4		
Aux. Flow Rate	13.96		13.66					
Main Flow Rate	3.07		3.50		2.7	3.3		***********
Total Flow Rate	17.14		16.66		15.0	18.4		
	0.70 A 1 A 1 A 1 A 1 A 1 A 1 A 1 A 1 A 1 A		1-00					
			Stand	dard				
VEN. (1907 - 1907)	Sampler		True	Raw				-111
Amb Temp	20.3			26.7				
Amb Press	873		884.35	887.2				
	-01		- J. J. J. J.	001.2				

) CO
								-
								-
0.55								
								-
Comments:								
								-
	6							
			.,.				- 1	
Calibrated By:	n ./	1/						

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

MEMORANDUM

DATE:

January 14, 2011

TO:

Chris Lanane, Scott Weaver

FROM:

Mike Horn

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Stanley Site, January 14, 2011," for your review. Please refer any comments you may have on the document to me by March 14, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

SITE: STANLEY SITE

Report Date: January 14, 2011 Prepared by: Mike S. Horn

1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Stanley was audited on January 12, 2011. The audit was conducted by Mike Horn and was witnessed by Scott Weaver, who is the site operator.

2.0 Parameters Audited:

T.E.O.M. PM-10

3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) AUDIT

Date of report:	1/14/11						
Date:	1/12/11			Site name: S	Stanley Site		
Start:	13:05hrs. PS	Т		Operator: S	Scott Weaver		
Finish:	13:25hrs. PS	Т		Project: S	SB 270		
Audited By:	Mike Horn			Site Elevation:	N/A ft.		
Witness:	Scott Weaver			Amb. Pres.:	901.60 hP	'a	
				Amb. Temp.:	8.6 de	g. C	
Prop. or Serial No.:	N/A			Make:	R & P		
Type:	PM-10			Model:	1400ab		
7.1				Last cal. date:	12/7/10		
	AUDI	T DEVICE(S)					
Make: BGI Incorporated				Make: I	Make: BGI Incorporated		
Model: DELTA CAL				Model: I	: DELTA CAL		
S/N:	525			S/N:	123		
Range:	2 - 20 lpr	n		Range:	2 - 20 lps	m	
Calibration Factors				Slope: Calibration Factors			
Slope:	1.00			Intercept:	1.00		
Intercept:	0.00			Cal Date:	0.00		
Cal Date:	12/22/10 Da	ite of first use 1	/12/11		12/22/10		
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.	
Leak check:	0.100	0.140	7.9	-0.7	901.57	0.0	
Pump off leak check:	N/A	N/A					
•	$Qa=[dPxTa/Pa]^{1/2}+b$		Site		Nominal Fl	ow Rates	
Audit	Audit Flow Rate,		Flow Rate	Diff.	Lower Limit	Upper Limit	
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)	
Total Flow Rate	17.02	17.02	16.67	-2.1	15.0	18.4	
Bypass/Aux Flow Rate	13.96	13.96	13.67	-2.1			
Main Flow Rate	3.09	3.09	3.00	-2.9	2.7	3.3	
Total Flow Rate	16.96	16.96	16.67	-1.7	15.0	18.4	

Comments: None.

TABLE A-1

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measureme	nt Variable	Evaluation Criteria		
Wind Speed		At ws ≤ 5 m/s, input ± 0.25 m/s; At ws > 5 m/s, input ± 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H		
Wind Direct	ion	input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor		
Temperatur	re	input $\pm0.5^{\circ}$ C input $\pm2.0^{\circ}$ C for PM-10, PM-2.5 samplers		
Relative Hu	midity	Ambient: input \pm 5% RH, \pm 1.5°C as dew point Gravimetry Lab: input \pm 5%		
Precipitation	n	input $\pm 10\%$		
Barometric Pressure		Ambient: input \pm 10 hPa TEOM: \pm 10 mm mercury		
PM-10: Hi-Vol SSI, Partisol, BGI, PM-2.5		input \pm 10%; Design Flow \pm 10% input \pm 4%; Design Flow \pm 5%		
TEOM:	Total Flow Main Flow Bypass Flow	input \pm 10%; Design Flow \pm 10% input \pm 10%; Design Flow \pm 10% input \pm 10%; Design Flow \pm 10%		
TEOM:	Leak Check	Main Flow: < 0.15 LPM Bypass Flow: < 0.60 LPM		

Appendix B

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

AUDIT DEVICE

	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL: Date of first use 1/12/11	123	12/22/09	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		

		apered	Element Oscil	lating Microba	ontrol District		
			FLO	W AUDIT		weether and in it	
						T	
D-4					00 1		
Dat Star				Site Name	JULIUV II JUL		
Finis		PST		Operator		Neaver	
rillisi	13:25	PST		Project	: SB270 /		
				Site Elevation		ft	
				Amb. Press.	1 4 1 1 1 1 2	in. Hg	198
		+	+	Amb. Temp.	8.6	deg. C	
Prop. Or Ser. No	: 793/1	207	2	Make	DOD		
	: PM10	0	1		1400a		
		100	1	Last Cal. Date:	12/1/10		
				T Dute.	12/1/10		
0.000		Audit	Device(s)				
Make	BGI INCOR	PORAT	FD	Make:	BGI INCOM	PORATED	Ì'
Model	· DELTA CAL		I	Model:	DELTA CAL	MATER	
S/N	0123			S/N:	0123	-	
Range	2 - 20	lpm		Range:	2 - 20	Ipm	
Calibration factors			Calibr	ration factors:	2 - 20		
Slope				Slope:	1.0	****	
Int.:				Int.:	0.0		
Cal Date:	122/0	7		Cal Date:			
	10 10 10						
Q _a =m[dPxT _a /P _a J ^{1/2} +b		Altitude Corre	ection Factor:	÷1013		
Leak Check-Initial							
Leak Check-Final	Main:	-/0	Aux:	.14			
Leak Check-Fillal	Main:		Aux:				
			Site				
Audit	Audit Flow	Rate	Flow Rate	Diff.	Nominal FI	ow Rates	
Point		(VLPM)	(VLPM)	(%)	Lower Limit		
Total Fow Rate	17.02	(• = • • • • •		(70)	(LPM)	(LPM)	
Aux. Flow Rate	12 91	- 1	3.00/13	1=166	7 15.0	18.4	
Main Flow Rate	3.69		3.00		2.7	3.3	
Total Flow Rate	16.96		16.67		15.0	18.4	
			1.0.1.0				
			Stand				
	Sampler		True	Raw			
Amb Temp			A	8.6			
ATTIC LIBERT	. 890		901.57	901.6			
Amb Press	-:010						
Allib Press							
And Fress							
Ann Fress							
Ann Fress							
Annu Press	0,10						
Annu Press							
Annu Press	0.70						
Ann Fress	0,10						
Ann Fress							
Comments:	0,10						
	0,10						
	0.70						
	0.10						